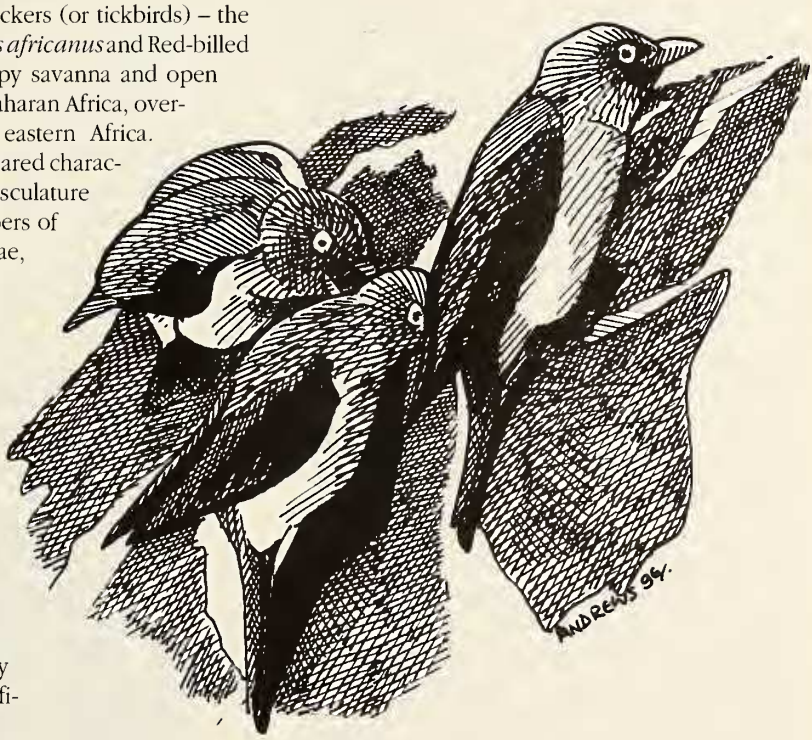
Oxpeckers, the genus *Buphagus*

Randall Breitwisch

Résumé: Les deux espèces de pique-boeufs – le Pique-boeuf à bec jaune *Bughagus africanus*, et le Pique-boeuf à bec rouge *B. erythrorhynchus* – occupent la savane et les habitats de bois ouverts en Afrique sub-saharienne et chevauchent l'Afrique australe et l'Afrique de l'Est. En raison de la présence de caractéristiques communes du squelette et la musculature, ils sont classés comme des membres de la famille de l'étourneau, les Sturnidées, dont 111 espèces se trouvent principalement en Afrique et dans le sud de l'Asie. Toutefois, alors qu'un grand nombre d'étourneaux africains ont un plumage chatoyant et des couleurs vives, ce n'est pas le cas des pique-boeufs.

The two species of oxpeckers (or tickbirds) – the Yellow-billed *Buphagus africanus* and Red-billed *B. erythrorhynchus* – occupy savanna and open woodland habitats in sub-Saharan Africa, overlapping in southern and eastern Africa. Owing to the presence of shared characteristics of skeleton and musculature they are classified as members of the starling family, Sturnidae, the 111 species of which are found primarily in Africa and southern Asia. However, while many African starlings have richly coloured, iridescent plumages, oxpeckers do not. On the basis of morphological, anatomical, and behavioural distinctiveness, oxpeckers have previously been accorded subfamily Buphaginae or even family Buphagidae status, a classification now out of favour.



Red-billed Oxpecker *Buphagus erythrorhynchus*
Mark Andrews

The morphology and behaviour of both species have become adapted to exploit the arthropods that live on the skin of large herbivorous mammals – on which both species depend. Oxpeckers are cooperative breeders, nesting in tree cavities and living in family groups of up to six individuals.

Evolution

Oxpeckers are highly modified for their foraging niche. Morphological adaptations for feeding on mammal bodies include short legs to hold the body close to the surface of the mammal and stiff tail feathers that provide support when the bird clings to the side of a mammal. They also have robust, strongly curved, and sharp claws which allow them to hang in all manner of postures while climbing over mammal bodies, even upside down on the legs or on the belly region. The bill is large and wide at the base, laterally flattened along its length, and used in the typical manner of a starling, with jabbing motions followed by opening the mandibles and moving through hair or working a

wound site for parasitic insects or necrotic tissue. Oxpeckers also use their bills in a scissoring manner, held sideways on mammal skin and moved through the hair. The bones of the palate are modified in association with this foraging niche. Behaviourally, oxpeckers have evolved an intimate relationship with large herbivores, and except when actively engaged in nesting duties, they spend nearly all daylight hours in the company of these mammals. Yellow-billed Oxpeckers even sometimes roost at night on mammals.

The Yellow-billed Oxpecker has the broader geographic range, occurring from Ethiopia across the continent to Senegal and south to northern Namibia, Botswana, and South Africa (but absent from the forested regions of West and Central Africa). Red-billed Oxpeckers occur in East Africa from Ethiopia and western Somalia south to northern South Africa.

Breeding

Oxpeckers nest in tree cavities using grasses, other herbaceous vegetation, and mammal hair, as nesting material and there are also records of mammal dung being used. Hair is cut from a mammal's body with the same scissoring action of the sharp-edged bill that is used in foraging for insects. The clutch size is usually 2 or 3 eggs (about 25x18 mm), with a range of 1 to 5. The eggs are white to bluish-white and either immaculate or spotted or blotched with brown to lilac. They are incubated for approximately 12 days, with a nestling period of another 28–30 days. Fledgling care lasts in excess of two months. Fledglings ride on mammals and beg for food from an adult foraging on the same mammal. Multi-brooded, oxpeckers attempt up to three nests during the long breeding period that coincides with the rainy season.

Both species are cooperative breeders, with up to three or four individuals (presumably, previous offspring) acting as reproductive helpers and sharing the task of feeding nestlings and fledglings. Only a single pair of birds in the family group breeds.

Identification

Unmistakable in appearance and behaviour, oxpeckers are nearly always encountered perching on and gleaning insects from the bodies of large herbivorous mammals. They are medium-sized passerines, (18–20 cm long), the Red-billed weighing about 50 g and Yellow-billed about 60 g. Below they are light brown to tan and dark, drab brown dorsally. Sexes are alike. In areas of sympatry, both species can be found not only on the same species of mammals but also on the same individual mammal.

Yellow-billed Oxpecker *Buphagus africanus*
Mark Andrews

The Yellow-billed Oxpecker has the basal half to two-thirds of the bill bright yellow, with the remaining apical portion scarlet red. The iris is orange-red, and there is no eye-ring. Drab, dark brown dorsal and breast plumage contrasts with variably light tan plumage in the ventral region. The rump is light tan in contrast to the surrounding dark brown dorsal plumage.

The Red-billed Oxpecker has a fully scarlet red bill. The red-orange iris is surrounded by a bright yellow eye-ring of soft skin or wattle. Drab, dark brown dorsal plumage blends into lighter brown ventral plumage, not nearly as contrasting as the very light ventral plumage of the other species. There is no discernible rump patch, while the bill is not as heavy as that of the Yellow-billed Oxpecker.

Immatures of both species lack the bright bill colour, being all dusky in immature Yellow-billed. In the Red-billed Oxpecker it is dull red basally and dull yellow to green apically. The iris of both species is brown to dull red-orange, and there is no eye wattle in the immature Red-billed Oxpecker.

Species biology

The most striking aspect of the species' biology is obviously the association with large herbivorous mammals. Favoured mammals include rhinoceros Rhinocerotidae, buffalo *Syncerus caffer*, giraffe *Giraffa camelopardalis*, warthogs *Phacocherus aethiopius*, and short-haired species of antelope, such

as impala *Aepycerus melampus* and some species of gazelle. Cattle are also favoured. Densely haired grazing mammals, such as waterbuck *Kobus ellipsiprymnus*, are less favoured, as are small-bodied species of gazelle Antilopini. African elephants *Loxondonta africana* appear to be intolerant of oxpeckers. Red-billed are more common in East Africa where the two species overlap. It has been suggested that, in sympatry, the Yellow-billed is more common on naked or thin-haired mammals, with the Red-billed more common on thickly-haired species. Despite the theoretical interest in determining how two such similar species apportion resources, there are few carefully collected data on the question of competition and ecological niche separation.

Ticks and blood-sucking flies and their larvae are the preferred foods captured from both mammal skin and the flesh exposed in injuries. Studies have indicated that several thousand nymphal ticks are eaten each day. Blood at wound sites is also taken. Most of the mammals attended are largely indifferent to oxpecker activities, even when oxpeckers climb onto the face or into an ear pinna. Some mammals, especially zebra and impala, appear to solicit cleaning by assuming stereotypical, upright postures that make available body regions. There has been speculation that oxpeckers may keep wounds open in foraging, perhaps farming insects but oxpeckers would seem to do more good than harm in ridding mammals of ectoparasites.

Red-billed Oxpecker *Buphagus erythrorhynchus*
Mark Andrews

Oxpeckers socialise while perching on mammals and even court and copulate on the backs of mammals. When approached by humans, the birds scurry over the back to the opposite side of the mammal, peer over the back, and give hissing vocalisations. Chattering calls similar to those of other starlings are often given when the birds are alarmed or in flight.

The degree to which oxpeckers may have a symbiotic defensive warning relationship with large mammals has been the subject of much speculation. Anecdotes abound on the mammalian alert response to the hissing vocalisations given by the birds in the presence of humans (and, perhaps, other predators). In the Kiswahili language, oxpeckers are known as askari wa kifaru, the 'guard of the rhinoceros.' However, the fascinating possibility of there being true mutualism in this association remains untested.

Relationships with humans

Oxpeckers have declined in numbers over much of their range during this century with the expansion of human populations and their cattle into areas once occupied exclusively by wild game. Cattle dipping removes many of the ectoparasitic insects that are the mainstay of the oxpecker diet. The great rinderpest epidemics at the end of the last century also probably played an important role in killing huge numbers of buffalo, a favoured host species. The Yellow-billed Oxpecker had, as a consequence, been extirpated from South Africa by the second decade of this century, although the species has reappeared in parts of northern South Africa in the past 10–20 years. There have been suggestions to reintroduce oxpeckers into areas such as national parks where game animal populations have been allowed to increase. A successful reintroduction was undertaken into Rhodes Matopos National Park in Zimbabwe.

Oxpeckers roost communally during the non-breeding season, sometimes in association with other species of starlings, at traditional sties. While these sites are typically natural elements in a habitat, such as trees and cliffs, they can also include buildings.

Dept of Biology, University of Dayton, 300 College Park, Dayton, Ohio 45469-2320, USA.